INCLUSIVE INNOVATION:
Using Technology to Bridge the Urban-Rural Divide

Canada must unlock the vast economic and human potential of small towns and rural communities by building the broadband infrastructure needed for citizens to prosper in an innovative, modern digital world.

By Wendy Cukier

In recent decades, the proportion of Canadians living in small towns or rural areas has increased. According to Statistics Canada's Labour Force Survey, employment in the rural fringe around urban centres is increasing at more than double the national rate. Proximity to urban labour markets enables rural workers to obtain higher-paying, urban-based jobs, which pushes up average earnings. In fact, rural areas close to urban centres have outperformed urban areas for economic growth, attracting businesses and people by offering lower costs and better quality of life.

Meanwhile, entrepreneurship and small- and medium-sized enterprises (SMEs) are considered engines of economic growth in Canada, and SMEs are key to the Toronto-Waterloo corridor as well as to rural and small-town Canada. Self-employment represents 21 percent of total employment in those areas. Small communities such as the Beauce in Quebec have strong entrepreneurial cultures and disproportionate shares of small businesses. Several studies have revealed the potential of rural-based innovation in, for example, agribusiness and tourism (Niagara, Ont. and Fogo Island, N.L., respectively), and the emergence of the rural creative class (Prince Edward County, Ont.

SUMMARY AND RECOMMENDATIONS

Small towns and rural areas in Canada have much to offer—access to nature, lower cost of living, lifestyle advantages—but many are declining with dwindling populations, lower education and lower employment levels. While they have the potential to drive economic growth and innovation, small towns and rural communities often lack the broadband infrastructure needed to prosper. Among our recommendations to bridge the urban-rural divide, governments need to:

- **recognize the importance of rural communities in fueling innovation, testing new solutions, driving economic development and attracting foreign investment**
- **accelerate the expansion of citizens' access to high-speed networks**
- **support solutions that strengthen linkages between smaller and larger communities and that attract and grow businesses in rural areas**
- **promote smaller communities so they can build partnerships and attract investment**
- **consider investments to address affordability of broadband connectivity and other digital services**

and Salt Spring Island, B.C.).

Smaller communities also have the advantage of being nimble and can be ideal sites for pilot projects and technology trials. For example:

- Hastings County, Ont. has been working with NASA's Jet Propulsion Lab to test the artificial intelligence application "Assistant for Understanding Data through Reasoning Extraction and sYnthesis" (AUDREY) to support emergency healthcare delivery and decision making by paramedics

- Stratford, Ont. was selected as the test site for a connected vehicles trial

- a number of smaller communities are shortlisted for the federal Smart Cities Challenge

None of these are possible without high-speed internet.

Lack of technology is holding back small towns and rural areas

Despite the blurring of boundaries between town and country and the assets of rural areas, many challenges remain for them, including declining birth rates, lower employment rates and wages, lower educational attainment and much less access to services such as public transportation, health care, policing and, in particular, high-speed internet. These issues are often amplified in rural communities with large Indigenous populations. Traditional explanations for this tend to be grounded in physical rather than digital economies. For example, proximity to large urban employment and consumer markets is particularly important when the focus is on moving people and physical goods.

But there is increasing evidence to support the notion that the issue lies in technology—that investing in technology infrastructure spurs economic development, especially in rural areas. In a seminal study, Ivus and Boland analyzed the impact of broadband deployment on urban and rural areas, concluding that the deployment of broadband from 1997 to 2011 promoted growth in aggregate employment and average wages in rural regions across Canada, particularly in service industries, while curtailing growth in urban areas. In other words, "it helped overcome the geographical barriers that have traditionally hampered rural employment growth."

This is partly because the digital economy operates in unique ways. Research suggests that the spatial dimensions of clusters for knowledge-intensive services are different than traditional physical supply chains and are less bounded by geography. In e-commerce, digital services and other industries, numerous examples exist of small rural companies becoming part of national and global supply chains, bypassing traditional networks. For example, Warkworth, Ont. engineer Marcus Leng commercially launched BlackFly, a revolutionary electronic personal aerial vehicle (ePAV) with help from the local incubator. His company, Opener, is now based in Silicon Valley after it connected to an international supply chain and global markets from Warkworth.

Some gaps are amplified by the digital divide

Despite decades of discussing the opportunities technology offers as a substitute for transportation in telecommuting, e-health, e-learning and more,

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the fact remains that many gaps between urban haves and small town or rural have-nots are amplified by the digital divide. These gaps include access to affordable inclusive digital infrastructure, digital skills and adoption of digital products and services. Many communities within 100 km of major urban centres are considered internet black-out zones, sometimes because of geography. Incumbent providers have tended to ignore rural and smaller communities, paving the way for enterprises such as the Eastern Ontario Regional Network and the Woodstock, N.B. Xplornet, which fill gaps in 5G service, and the Manitoba First Nations Technology Council, which is bringing internet access to Indigenous communities.

Canada has committed to ensuring that rural communities have priority access to wireless technology, particularly where other options are not available. While spectrum allocation decisions need to consider reliability and sustainability, some would argue that the processes historically have tended to favour big players with deep pockets rather than supporting new, innovative solutions. Recent decisions may help level the playing field.

Access to technology is not only important to support digital businesses, but also to support access to human and supply chain networks. It is also needed for social capital and intermediary services for start-ups and established businesses, including knowledge transfer, training, financing, legal services and marketing strategy development.

Federal, provincial and municipal governments in Canada and around the world are investing heavily with private sector and community partners to expand broadband development. Internationally, some governments treat internet access as a human right, and in Canada, a number of policy initiatives have been announced as a result of the CRTC's declaration that broadband is a basic service that should be available to all Canadians. Compared to other countries, however, Canada's geography and diffuse population make expanding broadband access especially challenging outside of urban centres. While 99 percent of Canadians have access to wireline telephone service, only 84 percent of Canadian households have access to fixed broadband internet services that meet CRTC's target speeds. However, there are massive disparities: 39% of rural households have access to this kind of service, versus 96% in urban areas according to a recent report of the Auditor General.

For decades, the Government of Canada has

invested in telecommunications to bridge geographic divides—from early experiments using satellites to later initiatives to build the "Information Superhighway." Public convenience and necessity have underpinned telecommunications regulation in an effort to ensure basic service provision to all Canadians. Predictably, as more competition has been introduced to the market, the disparity between the technology haves and have-nots has been exacerbated.

According to a CRTC report, at the end of 2015 the higher the download speeds, the wider the service availability gap between urban and rural areas. The report also emphasized the intersecting issues in First Nations communities, where it can be uneconomical to invest in broadband. A Manitoba Keewatinowi Inc. submission to the CRTC report said, "It is hard for the regulator to respond to market-driven change where there is no market."

Governments have tried to ameliorate these realities. The Broadband for Rural and Northern Development program invested $80 million in 63 projects from 2002 to 2005. More recently, the Broadband Canada: Connecting Rural Canadians program ran from 2009 to 2013, investing $225 million in 84 projects. Supported by these initiatives, regional programs have forged innovative public-private partnerships, such as the Eastern Ontario Regional Network, which invested $175 million and achieved impressive results, driving service delivery improvements and small business growth. Most important, the project broke new ground for establishing and leveraging complex partnerships and exploring new ways to think about innovation in a rural context.

More recent developments have included the release in December 2016 of the CRTC report Telecom Regulatory Policy CRTC 2016-496 "Modern telecommunications services—The path forward for Canada's digital economy," which proclaimed broadband internet a basic telecommunications service in Canada. A CRTC submission to the Canadian Innovation Agenda summarized these initiatives:

- Canada's Connect to Innovate committed $500 million dollars by 2021 to bring high-speed internet to 300 rural and remote communities in Canada.
- Canada announced trials to upgrade to 5G in the Toronto–Montreal corridor, including licenses for small players.
- The Smart Cities Challenge could help bridge the digital divide in rural communities (several Indigenous communities are among the finalists).

$7 BILLION

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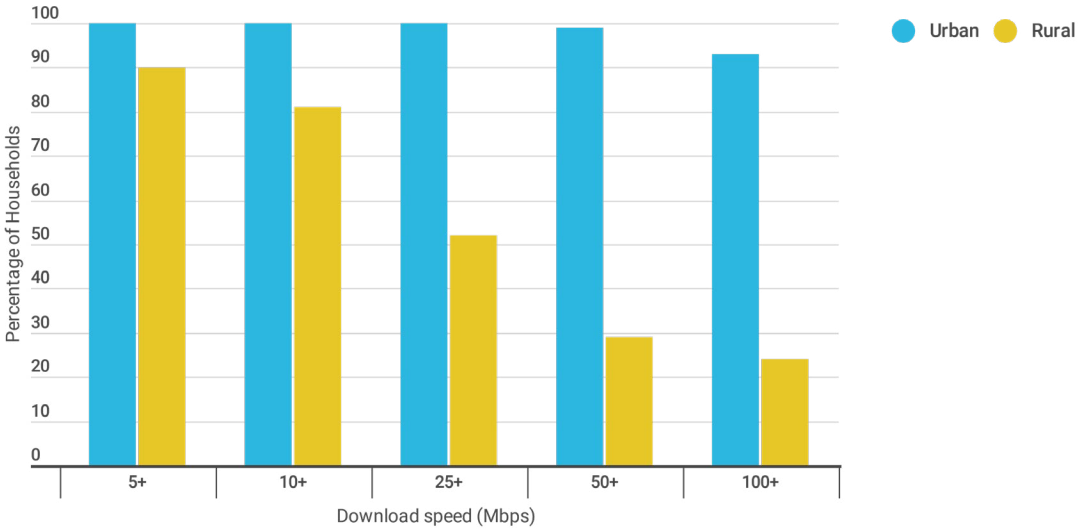
Canada needs a cohesive strategy

These investments will help Canada regain its position among the world's most connected nations,

RURAL AREAS LESS LIKELY TO HAVE FAST INTERNET ACCESS

National broadband availability, urban and rural population centres, 2015 (CRTC):



but a cohesive strategy is needed. Despite technological advances, we have only a fraction of the support needed to provide equitable access to internet services for Canadians. The most recent report, released in April 2018 by the Government of Canada's Standing Committee on Industry, Science and Technology, called Broadband Connectivity in Rural Canada: Overcoming the Digital Divide, affirmed the importance of innovative partnerships to improve connectivity. It also confirmed that current financial commitments from government, communities and the private sector serve only a fraction of what is needed to achieve equitable connectivity. They suggested an investment of $7 billion was needed to address the rural broadband shortfall.

The current public-private mix of investments has produced uneven results and, for many, slow progress. But what if the costs and benefits of access to digital infrastructure were reframed more broadly as foundational to providing access to the full range of public services, employment and education opportunities and as a way of strengthening the networks that build human as well as financial capital?

A chapter in Malcom Frank's recent book is titled "Data is Better Than Oil", pointing to the growing importance of the digital economy. As such, access to digital assets is one of the fundamental drivers of economic and social development, much as the transportation systems supporting physical movement of goods were in the past. By thinking of digital networks not as expenditures but as enablers, governments can unlock assets by:

- recognizing the importance of rural communities in fueling innovation, testing new solutions, driving economic development and attracting foreign investment
- taking an inclusive, user-centric approach to innovation, moving beyond digitizing government services to ensuring citizens have the tools, skills and bandwidth to access them
- applying a "rural" lens to the full range of government investments in technology, innovation, skills and economic development

- adopting an asset-based approach that conceptualizes digital networks as essential to driving economic development across all sectors, including agriculture, tourism, resources, service industries, etc.

Specific considerations and recommendations include the following:

CONSIDERATIONS

1 **Reframe the urban/rural dichotomy to recognize the range along the continuum. Include a rural lens on policies related to innovation, economic development, international trade and direct foreign investment, ensuring broader range of sectors (e.g. agribusiness) are considered.**

2 **Recognize that the high-speed networking requirements of business are significantly larger than those of consumers.**

3 **Recognize that innovation is manifest differently in smaller communities than it is in large centres and may be incremental, focused on process improvement and new business models.**

RECOMMENDATIONS

1 **Accelerate expansion of citizen access to high-speed networks to support drivers of economic development such as the development of digital skills and business, e-learning, e-health and telecommuting (e.g. Eastern Ontario Regional Network).**

2 **Incentivize solutions that strengthen linkages between smaller communities and larger centres (e.g. allocation of spectrum that privileges smaller communities, outsourcing functions that can be done remotely, specialized training and services beyond call centres).**

3 **Consider digital services investments to address affordability, similar to the Northern Ontario fuel tax credit.**

4 **Focus on incentives—such as one-stop shopping, networks and concierge services that help small businesses navigate the resources that support them—in order to attract and grow businesses in rural communities.**

Dr. Wendy Cukier is one of Canada's leading experts in disruptive technologies, innovation processes and diversity, with more than 200 published papers on technology, innovation and management. She is the coauthor of the bestseller "Innovation Nation: Canadian Leadership from Java to Jurassic Park". Wendy serves on a host of boards in the private and non-profit sectors and has helped create and grow several successful startups and social ventures including Flybits, Think2Thing and Growing North. She is the Academic Director of the Diversity Institute at Ted Rogers School of Management, Ryerson University which advances evidence-based strategies for inclusion.

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